

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PB/vR2412WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2004/014390	International filing date (day/month/year) 17.12.2004	Priority date (day/month/year) 05.01.2004
International Patent Classification (IPC) or national classification and IPC H01 B7/08, H05K3/24, H05K3/28		
Applicant ALCAN TECHNOLOGY & MANAGEMENT LTD.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 13 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-9 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. 1-14 _____ as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* _____ received by this Authority on _____
- nos.* _____ received by this Authority on _____
- ☒ the drawings:
- sheets 1/3-3/3 _____ as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	3-14	YES
	Claims	1, 2	NO
Inventive step (IS)	Claims		YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1. This report makes reference to the following documents:

- D1: US 4659 872 A (DERY RONALD A ET AL) 21 April 1987
- D2: US-A-5 262 590 (LIA RANDELL B) 16 November 1993
- D3: US-A-5 053 583 (ROBERTS LINCOLN E ET AL) 1 October 1991
- D4: DE 23 27 549 A (WESTERN ELECTRIC CO) 6 December 1973
- D5: PATENT ABSTRACTS OF JAPAN vol. 1995, no. 07, 31 August 1995 & JP 07 106757 A (MATSUSHITA ELECTRIC IND CO LTD), 21 April 1995
- D6: US-A-3 206 541 (JACHIMOWICZ LUDWIK) 14 September 1965
- D7: US-A-3 060 062 (GEORGE KATZ ET AL) 23 October 1962
- D8: US 2001/006252 A1 (KIM YOUNG ET AL) 5 July 2001
- D9: FR-A-2 530 874 (JAEGER) 27 January 1984

2. INDEPENDENT CLAIM 1

2.1 The subject matter of this claim does not, to the

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extent that it can be understood by a person skilled in the art owing to the lack of clarity (see Box VIII, point 1.1), appear to be novel within the meaning of **PCT Article 33(2)**:

D1 (the references in parentheses are to D1) discloses:

- a flexible structure consisting of a base layer made of plastic and at least one electrically conductive structure which is imprinted with an electrically conductive ink at least on the base layer on one side thereof (column 3, lines 49-67; figures 1 and 2),
- wherein the at least one electrically conductive structure is situated between the base layer and at least one cover layer made of plastic, and the base layer is connected to the at least one cover layer (column 4, lines 5-29; figure 3).

D1 therefore discloses all the technical features of one of the two alternative embodiments of this claim (**PCT Article 33(3)**).

- 2.2 Furthermore, the subject matter of **claim 1**, to the extent that it can be understood by a person skilled in the art owing to the lack of clarity (see Box VIII, point 1.1), does not involve an inventive step within the meaning of **PCT Article 33(3)** in relation to the flexible printed circuit known from **D2**:

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D2 discloses in column 4, lines 18-44 and figures 1-6 a flexible printed circuit which differs from one of the two alternative embodiments of the flexible structure according to claim 1 only in that the electrically conductive structure is imprinted with electrically conductive ink.

This feature is an option for the design of an electrically conductive structure on a flexible carrier which is obvious and generally known to a person skilled in the art (see, for example, D1: column 1, lines 60-64) and which a person skilled in the art would select according to the circumstances in order to solve the stated problem, without thereby being inventive (**PCT Article 33(3)**).

Furthermore, it should be noted that a person skilled in the art would also take, in particular, the production costs of the desired electrically conductive structure into account when selecting the material for this structure. It can therefore be derived from D2, column 7, lines 54-57, that electrical shielding can be accomplished, not only by a metal layer covering the entire surface, but alternatively also by a structured metal layer, for example, therefore also by a conductor structure.

3. DEPENDENT CLAIMS 2 TO 11

These claims, to the extent that they can be

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understood by a person skilled in the art owing to the lack of clarity of independent claim 1, to which these claims refer back (see Box VIII, point 1.1), do not appear to contain any features which, in combination with the features of any claim to which they refer back, meet the PCT requirements for novelty and inventive step:

3.1 **Claim 2:**

3.1.1 **D1** also discloses that the at least one cover layer has an additional electrically conductive structure imprinted with electrically conductive ink on the at least one cover layer and that an electrically insulating intermediate layer made of plastic is situated between the electrically conductive structures (column 5, lines 21-50 and figures 6-8 in combination with column 7, lines 10-23 and figure 20).

D1 therefore also discloses the technical features of claim 2. The subject matter of this claim is therefore not novel (**PCT Article 33(2)**).

3.1.2 An arrangement with an additional electrically conductive structure according to claim 1 is also known from **D2**, column 5, lines 50-68 in conjunction with figures 4-6 (**PCT Article 33(3)**; see also the comment under point 2.2 of this box regarding the selection of material for the electrically conductive structures).

3.2 **Claim 3:**

The feature of this claim is known from **D2**,

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figures 4-6 (**PCT Article 33(3)**; see also the comments made in Box VIII, point 1.2, regarding the lack of clarity).

Furthermore, D2, column 7, line 54 - column 8, line 3, discloses the fold arrangement according to the present international application, figures 4-6.

It should also be noted that D8, figures 5, 11 and 13-15, discloses fold arrangements of a flexible carrier for stacking a plurality of electronic components and the corresponding electrically conductive structures. The layer sequence and the position of the electrically conductive structures relative to each other can be set according to the fold arrangement.

3.3 Claim 4:

A flexible structure which has electrically conductive structures and is rolled up is known from D3, figure 3. A person skilled in the art would therefore provide this feature instead of the features regarding the fold arrangement of the flexible structure in the flexible structure known from D2, without thereby being inventive, and, in this process, would also modify the electrically conductive structures accordingly in order to arrive at a cable having a substantially round cross-section (**PCT Article 33(3)**; see also D3, column 3, line 42 - column 4, line 10).

A flexible carrier having the feature of this claim is also disclosed in D8, figure 15.

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3.4 Claim 5:

Conductor arrangements of this type are generally known (see, for example, D4, figure 1) and as such cannot substantiate an inventive step (**PCT Article 33(3)**).

3.5 Claim 6:

The subject matter of this claim does not involve an inventive step in relation to a combination of **D1 or D2 and D5 (PCT Article 33(3))**.

3.6 Claims 7 to 11:

The concept of designing a barrier layer, in particular a metal layer, such that it is impermeable to water vapor for making a cable more weather proof is generally known to a person skilled in the art of cable systems (see, for example, **D6**, column 1, line 71 - column 2, line 3; column 3, lines 4-18 in combination with column 4, lines 19-24).

The subject matter of **claims 7 and 8** therefore does not involve an inventive step in relation to a combination of **D1 or D2 and D6 (PCT Article 33(3))**.

The technical features of **claims 9 to 11**, which refer back to claim 8, are further, alternative embodiments that cannot be regarded as inventive (**PCT Article 33(3)**).

4. INDEPENDENT CLAIM 12

The method according to **claim 12**, to the extent

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that it can be understood by a person skilled in the art owing to the lack of clarity (see Box VIII, point 1.3), does not appear to be inventive because the use of gravure printing for the structured application of ink to a flexible carrier is obvious and generally known to a person skilled in the art (**EPC Article 56**).

5. DEPENDENT CLAIMS 13 AND 14

To the extent that a person skilled in the art can understand the subject matter of these claims owing to the lack of clarity of independent claim 12, to which these claims refer back (see Box VIII, point 1.3), the subject matter of these claims does not involve an inventive step within the meaning of **PCT Article 33(3)**.

5.1 The method feature of **claim 13** is, to a person skilled in the art, a generally conventional and obvious feature for producing an electrically conductive printed structure with better electrical conductivity (**PCT Article 33(3)**; see, for example, **D7**, column 2, line 67 - column 3, line 10).

5.2 Since the features of claim 6 are not inventive (see point 3.5 of this box), the general method features for producing an electrically conductive printed structure according to claim 6 as claimed in **claim 14** are therefore also not inventive in relation to a combination of **D1 or D2 and D5** (**PCT Article 33(3)**).

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6. Claims 1 to 14 meet the requirements of PCT Article 33(4) because they are industrially applicable.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The application fails to meet the requirements of **PCT Article 6** because the subject matter of **claims 1 to 14** is unclear:

- 1.1 **Claim 1:**

- (a) The term "*flexible carrier*" generally refers to a base or a frame as a supporting element for additional elements mounted thereon. Although the subject matter of claim 1 is generally designated as a "flexible carrier", technical features associated therewith appear, instead, to define a flexible, multilayered structure as a carrier. This leads to doubt with regard to the subject matter for which protection is sought (**PCT Article 6**).
 - (b) The geometrical arrangement of the additional cover layers relative to the base layer and the at least one cover layer is not clear from this claim. The technical feature whereby the additional cover layers are connected to adjacent cover layers also does not help to clarify the geometrical arrangement since it is not clear which cover layers are the adjacent cover layers, and the term "*adjacent*" does not clarify the relative position of the cover layers to each other (**PCT Article 6**).

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(c) The term "*connected*" is unclear because the technical features associated therewith are neither provided in nor derivable from this claim. In particular, it is not clear to a person skilled in the art how the connection is made and what technical features bring about the connection (**PCT Article 6**).

1.2 **Claim 3:**

The phrase "*base layer folded at least one time around itself*", according to general usage, appears to define a fold arrangement of a flexible structure as found in the embodiments of **D2 and D9** (see D9, figures 2 and 4 and D2, figures 4-6).

The aforementioned fold patterns cannot be found in the description and the drawings of the present international application, and this claim is therefore not fully supported by the description and the drawings (**PCT Article 6**).

In this connection, reference is made to the alternative terminology for this fold pattern used in **D9** (see D9, page 6, lines 2-7) and also the corresponding terminology used in **D8** (see D8, paragraph 13, paragraph 53 in conjunction with figure 5).

1.3 **Independent method claim 12:**

Claim 12 fails to meet the requirements of PCT Article 6 because the subject matter for which protection is sought is not clearly defined. The

Box No. VIII Certain observations on the international application

claim attempts to define the subject matter in terms of the result to be achieved. Such a definition is allowable only under the conditions outlined in the PCT International Search and Preliminary Examination Guidelines, Chapter 5, paragraph 5.35. In the present case, however, such a formulation is not allowable because it appears to be possible to describe the subject matter of the application in more concrete terms, i.e. by providing

- the technical features that lead to a continuous printing process
- the technical features of a flexible carrier suitable therefor and
- the technical features of a method of producing an electrically conductive structure by imprinting an electrically conductive ink.

1.4 **Claims 2 to 11**, which are dependent on claim 1, and **claims 13 and 14**, which are dependent on independent claim 12, are therefore also not clear.